

Center For Health Effects of Environmental Contamination | CHEEC

2005 ANNUAL REPORT



## MISSION AND STRUCTURE

CHEEC'S MISSION, STATED IN THE GROUNDWATER PROTECTION ACT, IS TO "DETERMINE THE LEVELS OF ENVIRONMENTAL CONTAMINATION WHICH CAN BE SPECIFICALLY ASSOCIATED WITH HUMAN HEALTH EFFECTS." ACTIVITIES TO ACHIEVE THE MISSION INCLUDE CONDUCTING AND FUNDING PILOT LEVEL RESEARCH, ORGANIZING AND HOSTING EDUCATIONAL PROGRAMS, ASSEMBLING DATA TO BE USED IN HEALTH EFFECTS RESEARCH, AND WORKING COLLABORATIVELY WITH STUDENTS, FACULTY AND QUALIFIED RESEARCHERS WHOSE INTEREST AND EXPERTISE ARE IN ENVIRONMENTAL HEALTH.

CHEEC ADMINISTRATIVELY REPORTS TO THE UNIVERSITY OF IOWA VICE PRESIDENT FOR RESEARCH. CHEEC'S CORE ACTIVITIES SUPPORT THEIR VISION OF ATTAINING EXCELLENCE AND DISTINGUISHED RESEARCH AND SCHOLARSHIP.

## DATA MANAGEMENT

A core element of CHEEC is its environmental database management capabilities. CHEEC Data Management Center (CDMC) continues to be a key component in realizing and sustaining CHEEC's mission and objectives. CDMC's leadership in environmental health data research activities continues to expand into development and support of large multi-year environmental health research grants.

### In 2005, CDMC provided database support for:

- Research and data management support for Muscular Dystrophy Surveillance Tracking and Research Network (MDSTARNet) in cooperation with the Iowa Registry for Congenital and Inherited Disorders; funding provided by the Centers for Disease Control and Prevention (CDC). CHEEC is the lead data management and computer applications group for this multi-year, multi-center study.
- Data management for the Agricultural Health Study has been a continuing effort since 1994. Funding is by the US Environmental Protection Agency and the National Institutes of Health.
- Research and database management on the Comprehensive Assessment of Rural Health in Iowa (CARHI) in collaboration with the UI Departments of Geography, Occupational and Environmental Health, and Family Medicine. Funding is provided by the CDC.

In addition, CHEEC updates and maintains a comprehensive drinking water database for the state of Iowa. Yearly new data are located and added to the system. Currently, over 1.3 million individual drinking water contaminant records are linked to Iowa's public drinking water supplies, dating back to 1910. These data are actively used and applied to epidemiologic work and public policy inquiries.

**THE CHEEC DATA MANAGEMENT CENTER SUPPORTS STUDENTS HAVING A CAREER INTEREST IN ENVIRONMENTAL AND HEALTH SCIENCES FIELDS THROUGH PRACTICUM EXPERIENCES AND INTERDISCIPLINARY RESEARCH ENDEAVORS.**

# RESEARCH

## **Iowa Statewide Rural Well Water Survey Phase 2 (SWRL 2)**

PRINCIPAL INVESTIGATOR: Peter Weyer, CHEEC

CO-INVESTIGATORS: R. William Field, UI Department of Occupational and Environmental Health, Michael Wichman, University Hygienic Laboratory, and Leon Burmeister, Department of Biostatistics

This three year project is a collaboration of CHEEC, Iowa Department of Natural Resources, University Hygienic Laboratory, UI College of Public Health, and the United States Geological Survey. The goal of SWRL 2 will be a one-time sampling of 525 private rural drinking waters. SWRL 2 aims to duplicate parts of the original SWRL study of 1988-89; year one effort will locate and sample wells from the original study. Objectives are to assess water quality in a select sample of Iowa's private rural drinking water wells, identify what contaminants of public health interest are in the water and at what concentrations, and identify any spatial and temporal variations.

## **Seed Grants**

CHEEC awards approximately one-third of its annual allocation to pilot scale research. In return, the research program has generated over eight dollars in external funding for every dollar invested. In the past 5 years, seed grants have attracted an additional \$3.8 million in external funding for researchers at the University of Iowa and Iowa State University.

## **CHEEC awarded the following seed grants in 2005:**

### **Adsorption of Environmental Pollutants Using Nanocrystalline Zeolites**

INVESTIGATOR: Sarah Larsen, Department of Chemistry, University of Iowa

### **Development of Molecular Techniques for the Detection of Vinyl Chloride Degrading Bacteria in the Environment**

INVESTIGATOR: Timothy Mattes, Department of Civil and Environmental Engineering, University of Iowa

### **Passive Sampling of Ambient Air Particulate Matter**

INVESTIGATORS: Thomas Peters, Darrin Ott, Department of Occupational and Environmental Health, University of Iowa

### **White-tailed Deer, Mosquitoes, and the Ecology of West Nile Virus**

INVESTIGATORS: James Gill, Kaitlin Rainwater, University Hygienic Laboratory, University of Iowa



RESEARCH BEGAN ON THE IOWA STATEWIDE RURAL WELL WATER SURVEY PHASE 2 (SWRL2) IN 2005. THE STUDY WILL ASSESS DRINKING WATER QUALITY IN 525 PRIVATE RURAL WELLS OVER A 3 YEAR PERIOD. THIS EFFORT DRAWS TOGETHER THE COMPLEMENTARY CAPABILITIES OF CENTER STAFF IN DATA MANAGEMENT AND ENVIRONMENTAL HEALTH RESEARCH.

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### Cooperative Research

In 2005, the following cooperative research project was conducted and completed:

#### The Iowa Beach Study

CO-PRINCIPAL INVESTIGATORS: Michael Wichman, University Hygienic Laboratory, Eric O'Brien, Iowa Department of Natural Resources Water Monitoring Program

FUNDING: CHEEC, Iowa Department of Natural Resources, and UI Center for Emerging Infectious Diseases, UI College of Public Health (in-kind)

Iowa's state-owned beaches are heavily used during late spring, summer and early fall months for swimming and other recreational activities. The Iowa Department of Natural Resource's Beach Monitoring Program collects water samples weekly from April 15 until October 31 at state-owned beaches. Samples are analyzed for E. coli and enterococci to assess the risk for waterborne diseases that may result from immersion in the water. This pilot study enrolled 1,000 beach users in the summer of 2005 to determine the rates of self-reported gastrointestinal illnesses/symptoms in swimmers and non-swimmers, and correlate those rates with bacterial levels in beach water.



# SERVICE/EDUCATION ACTIVITIES

CHEEC staff participate in environmental health service and education activities through committee membership, organizing and funding educational programs, and answering environmental health questions from the public through the CHEEC website or referrals from public and environmental health agencies.

In 2005 CHEEC served as host for a conference sponsored by National Institute for Environmental Safety and Health titled *Atrazine and the Health of Humans and Wildlife: State of the Science and Future Research Needs*. Scientists from industry, government, and academia, and policy experts representing farm and environmental groups participated in this conference.

CHEEC sponsors seminars of interest to interdisciplinary audiences on environmental health issues.

[The following seminars were held on the UI campus in 2005:](#)

## **Emerging Contaminants and Drinking Water**

George Hallberg, Ph.D., Cadmus Group Incorporated

CO-SPONSOR: University Hygienic Laboratory

## **Applications of GIS in Cancer Epidemiology: Pesticides and Drinking Water Nitrate**

Mary Ward, Ph.D., National Cancer Institute

CO-SPONSORS: Iowa's Center for Agricultural Safety and Health and UI Department of Geography

## **Atrazine Impacts on Human Health and Wildlife**

Timothy Pastoor, Ph.D., Syngenta Crop Systems, Tyrone Hayes, Ph.D., University of California-Berkeley

[CHEEC awarded two education grants in 2005. They were:](#)

- Partial support for the *Midwest Agricultural Safety and Health Forum: Bridge Building: Research to Practice*, sponsored by Iowa's Center for Agricultural Safety and Health.
- Partial support for *Governor's Conference on Environmental Education*, hosted by the Iowa Environmental Council with further support from Resource Enhancement and Protection (REAP), and Living Roadway Trust Fund.

# WHO WE ARE

## CHEEC Center Staff

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## Executive Committee

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Michael Wichman, Ph.D.

## Advisory Committee

David Bennett, Ph.D., *UI Department of Geography*

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R. William Field, Ph.D., *UI Department of Epidemiology*

Keri Hornbuckle, Ph.D., *UI Department of Civil and Environmental Engineering*

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In 2005, CHEEC participated in research focusing on water quality on both the recreational and drinking water fronts. The Iowa Beach Study was conducted as a pilot project to determine whether bacterial levels in beach water had any impact on swimmer's health. Over 1,000 persons were enrolled at three beaches in eastern Iowa in June and July, 2005. Study results will provide information that will tell us whether Iowans may be at risk of gastrointestinal illness from beach water. The Iowa Statewide Rural Well Water Survey Phase 2 (SWRL 2) began in the fall of 2005. SWRL 2 is a follow-up to the 1988-89 SWRL Survey, which found that a high proportion of private rural drinking water wells in Iowa were contaminated with nitrate and bacteria and, to a lesser extent, commonly used herbicides. SWRL 2 will sample wells for these contaminants, and also look for emerging contaminants such as arsenic, several herbicide degradates, and perchlorate. Private wells are not regularly tested under any statutory authority. Private well users may be exposed over the long term to low levels of these compounds.

The CHEEC seed grant program also awarded \$100,000 in research grants to study air pollutants, tick-borne viruses, and methods to reduce or breakdown environmental pollutants using emerging technologies. This report presents overviews of these and other CHEEC activities which took place in 2005. For more information, please check out our website at [www.cheec.uiowa.edu](http://www.cheec.uiowa.edu).

Pete Weyer  
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